

From the gravel beds.	{ No. 2 5 8 10 } Average.	Soluble in acid ..	per cent.	per cent.	carbonate of lime.
		Insoluble in acid	55 $\frac{2}{3}$	63 $\frac{1}{2}$ $\frac{3}{8}$	

It only remains for me to express my hope of being able, on a future occasion, to enter more fully into the various remarkable changes which are observable in the materials enclosed within both the perfectly and the only partially closed nodular chambers. I also hope to be able to furnish a series of perfected analyses of the solid materials, and of that most interesting portion of the sealed-up nodular contents—namely, the water handed down to us from that grand old ocean,—all these details being inseparably connected with the flint-question as a whole.

June 16, 1881.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

May 11, 1881.—Robert Etheridge, Esq., F.R.S.,
President, in the Chair.

The following communications were read:—

1. “Notes on the Fish-remains of the Bone-bed at Aust, near Bristol, with the Description of some new Genera and Species.” By James W. Davis, Esq., F.S.A., F.G.S.

The fossil fishes described in this paper are from the Rhætic bed at Aust Passage. The stratum containing the fish-remains is rarely more than 9 inches thick, often considerably less, and is composed of rounded masses of hardened clay or marl, which, at the time of their deposition, were soft enough to receive the impressions of the coprolites and fish-remains. There are large numbers of coprolites and bones of fishes, as well as some remains of Saurians, mingled with each other indiscriminately. The fishes belong to the orders Plagiostomi and Ganoidei, some of the former being of considerable size. It is inferred, from the intermixture of Saurians and fishes, that the deposit is the result of shallow water existing near land, in which the fishes lived and the Saurians occasionally disported themselves.

Besides the fossil remains of the animals which lived during the deposition of the Aust beds, there are also others which appear to have been derived from the Mountain Limestone and the Coal-measures, representing such genera as *Psammodus*, *Psephodus*, *Helodus*, and *Ctenoptychius*. Fossil teeth of these genera occur scattered rather sparingly through the mass; they are very perfectly preserved, and

do not show any signs of attrition. They must, however, be the result of the disintegration of older rocks, or the genera which they represent existed to a much later period than is generally supposed. The following new species were described:—*Ctenoptychius Ordii*; *Nemacanthus filifer*, Ag., varieties α and β ; *Nemacanthus minor*; *Sphenonchus obtusus*; *Hybodus austinensis* and *pustulosus*; *Petalodus*?

2. "On some Fish-spines from the Coal-measures." By J. W. Davis, Esq., F.S.A., F.G.S.

The author described in this paper three species of a new genus of fossil fish from the Carboniferous formation, two of the species having been found in the Cannel Coal of the West Riding of Yorkshire, and the other in the Burghlea limestone, near Edinburgh. *Anodontacanthus* is a straight spine, offering many points of resemblance to some of the Pleuracanth: it has a similarly close-grained microscopical structure; the internal cavity opens terminally at the base of the spine; and it was not deeply implanted in the flesh of the fish. It, however, differs from all the Pleuracanth in being quite free from external denticles; its surface is plain or but slightly striated; whilst that of *Pleuracanthus* always possesses a double row of denticles, either ranged laterally along the exposed part of the spine or in some position between the lateral and posterior aspects of the spine. It is possible that evidence may be discovered which will render necessary the removal of these spines to the genus *Pleuracanthus*; but at present there is no evidence that such is advisable. All the specimens of *Pleuracanthus*-spine found associated with teeth or shagreen have been armed with the double row of denticles; and at present no evidence exists that spines without denticles were associated with remains of this genus. It is therefore considered best to institute a new genus for the three species, with the name *Anodontacanthus*, in allusion to its having no teeth or denticles.

3. "On some Specimens of *Diastopora* and *Stomatopora* from the Wenlock Limestone." By Francis D. Longe, Esq., F.G.S.

Mr. Longe showed and described some specimens of Bryozoa from the Wenlock Limestone of Dudley, which he compared with corresponding forms from the Oolite and later periods, and pointed out the close similarity of the Silurian with the later forms, in respect of the shape and dimensions of the cells, as well as in the habit of cœnœcic growth.

Alluding to some other Palæozoic forms, assigned to the Bryozoa under the generic names of *Berenicea* and *Ceramopora*, he pointed out the difference between the shape of the cells in these forms and those which he had described, and expressed a doubt whether they should be classed as Bryozoa at all.

On the other hand he referred to some specimens described by Professor Nicholson (Ann. & Mag. Nat. Hist. vol. xv., 1875) under the names of *Alecto auloporoides* &c., as having the true Bryozoan

cell, and furnishing additional evidence of the existence, in the Silurian seas, of forms of Bryozoa which, though very abundant in the Oolite and all subsequent periods, were not generally supposed to have existed in the Palæozoic period.

4. "On a new Species of *Plesiosaurus* (*P. Conybeari*) from the Lower Lias of Charmouth, with Observations on *P. megacephalus*, Stutchbury, and *P. brachycephalus*, Owen." By Prof. W. J. Sollas, M.A., F.R.S.E., F.G.S., &c., Professor of Geology in University College, Bristol; accompanied by a Supplement on the Geological Distribution of the Genus *Plesiosaurus*, by G. F. Whidborne, Esq., M.A., F.G.S.

The greater part of this paper was devoted to the description of a remarkably fine specimen of *Plesiosaurus* from the *Ammonites-obtusus* zone of the Lower Lias, Charmouth. Its distinctive characters are as follows:—

1. The length of the skull is 19·75 in., taken from the anterior extremity of the lower jaw to the posterior margin of the quadrate.

2. There are sixty-six vertebræ, of which thirty-eight are cervical, twenty-one dorsal, two sacral, and five caudal.

3. The length of the neck is 83 in.; and the cervico-cephalic index is 24·1.

4. The length of the cervico-dorsal series is 136 inches; and the cervico-dorsal-cephalic index is 14·6.

5. The length of the centrum in the anterior cervical vertebræ is equal to the height, and greater than the breadth of the articular face. In vertebra xv. the measurements are—length 2 inches, breadth 1·5 inch, height 2 inches.

6. In the posterior cervical vertebræ the breadth of the articular face is greater than the length or height, but the latter two dimensions remain equal.

7. The neural spines increase in size up to vertebra xl., in which they measure 4·75 inches in length.

8. The neural spines are inclined backwards as far as vertebra lv.; past this, up to lvii., they are inclined forwards; but afterwards they again incline backwards.

9. The humerus and femur are nearly equal in length, the femur being slightly the shorter.

For the species the name of *P. Conybeari* is proposed. *P. Conybeari* agrees closely with *P. Etheridgei* in the relative length of head and neck; but it has eight more cervical vertebræ than the last-mentioned species. In the number of the cervical vertebræ it agrees with *P. homalospondylus*, but has a much larger cervico-cephalic index.

5. "On certain Quartzite and Sandstone Fossiliferous Pebbles in the Drift in Warwickshire, and their probable Identity with the true Lower Silurian Pebbles (with similar fossils) in the Trias at Bud-

leigh Salterton, Devonshire." By the Rev. P. B. Brodie, M.A., F.G.S.

The author notices some previous remarks upon these pebbles, which, in Warwickshire and elsewhere, either occur in the Trias or have been derived from it. To account for these, he supposed that there had been a more northerly extension of Silurian rocks than can now be detected in Central England. The Lickey quartzite has been supposed to have contributed some of these; but the author states that he has not found any one well-defined Llandovery species, but that the most characteristic are Lower Silurian. These pebbles are most abundant south of Birmingham, towards Warwick and Stratford-on-Avon. They agree lithologically with the Budleigh-Salterton pebbles; these, as it has been shown, are partly Lower Silurian, partly Devonian, partly Carboniferous. The author gives a list of species collected by him from the Warwickshire pebbles. Sixteen are present from the twenty-four Lower-Silurian forms found in Devonshire. Notwithstanding their identity, physical considerations forbid the supposition that they have been derived directly from that locality or Normandy; so that it is probable these Lower Silurian quartzite rocks once extended much further to the north.

BIBLIOGRAPHICAL NOTICES.

On the Structure and Affinities of the Genus Monticulipora and its Subgenera. By H. ALLEYNE NICHOLSON, M.D., D.Sc., F.R.S.E., F.L.S., Professor of Natural History in the University of St. Andrews. 8vo. Edinburgh & London: W. Blackwood & Sons, 1881.

THIS work is a further result of the continued palæontological researches of Prof. Nicholson, and although perhaps not so generally interesting as his previous volume on the Tabulate Corals, is not a less important contribution to the history of a difficult and variable group of Cœlenterata—the Monticuliporidæ, whose relations and affinities have of late years been the subject of investigation. In his previous work Prof. Nicholson only treated generally of *Monticulipora* and its immediate allies. The matter there given, greatly expanded and improved by more extended observations of his own and other authors', is incorporated in the present treatise.

The general history and literature of *Monticulipora* and the allied genera, including an analysis of the classification of Dybowski, is followed by a chapter on its comparative structure, in which the forms of the corallum, the differential structure of the walls of the corallites as compared with those in *Stenopora* and *Chætetes*, and the surface features are described; under the latter head are the "monticules" (circumscribed areas on the surface of the corallum, which are more or less elevated above the general level), from the presence of which the name of the genus is derived.